PENDING CLAIMS

1. (Original) A thin-film electrochemical cell structure, comprising:

a cathode sheet layer comprising a series of discontinuous cathode sheets, each of the cathode sheets comprising:

a cathode layer; and

a current collector layer having a first surface contacting a first surface of the cathode layer;

a gap defined between adjacent ones of the cathode sheets; and

a solid electrolyte layer contacting a second surface of the cathode layer and extending across the gaps defined between the adjacent cathode sheets.

2. (Original) The structure of claim 1, further comprising an electrical insulator layer contacting a second surface of the current collector layer.

3. (Original) The structure of claim 2, wherein the electrical insulator layer extends across the gaps defined between the adjacent cathode sheets.

4. (Original) The structure of claim 1, wherein the electrolyte layer comprises a solid polymer electrolyte layer.

5. (Original) The structure of claim 1, wherein the gap defined between adjacent cathode sheets ranges between about 0.015 inches and about 0.4 inches.

6. (Original) The structure of claim 1, wherein a width of the cathode sheets ranges between about 0.75 inches and about 24 inches.

7. (Original) The structure of claim 1, wherein a length of the cathode sheets ranges between about 0.25 inches and about 24 inches.

8. (Original) The structure of claim 1, wherein the solid electrolyte layer encompasses a perimeter of the cathode layer of each of the cathode sheets.

9. (Original) The structure of claim 1, wherein the solid electrolyte layer comprises a first edge and a second edge, and each of the cathode sheets comprises a first edge and a second edge, the first and second edges of the solid electrolyte layer extending beyond the first and second edges of each cathode sheet by between about 0.04 inches and about 0.31 inches.

10. (Original) The structure of claim 1, wherein the current collector layer comprises a first edge and a second edge, and the cathode layer comprises a first edge and a second edge, the first edge of the current collector layer extending beyond the first edge of the cathode layer.

11. (Original) The structure of claim 10, wherein the first edge of the current collector layer extends beyond the first edge of the cathode layer by between about 0.08 inches and about 0.51 inches.

12. (Original) The structure of claim 10, wherein the second edge of the current collector layer extends beyond the second edge of the cathode layer by between about 0.0 inches and about 0.315 inches.

13. (Original) The structure of claim 1, wherein the series of discontinuous cathode sheets is arranged in a plurality of rows to define a matrix of the discontinuous cathode sheets, and a gap defined between adjacent rows ranges between 0 inches and about 0.63 inches.

14. (Original) The structure of claim 1, wherein the solid electrolyte layer comprises a first edge, the current collector layer comprises a first edge, and the cathode layer comprises a first edge, the first edge of the current collector layer extending beyond both the first edge of the cathode layer and the first edge of the solid electrolyte layer.

15. (Original) The structure of claim 14, wherein the first edge of the current collector layer extends beyond the first edge of the solid electrolyte layer by between about 0.04 inches and about 0.35 inches.

16. (Original) The structure of claim 14, wherein the first edge of the solid electrolyte layer extends beyond the first edge of the cathode layer.

17. (Original) The structure of claim 14, wherein a second edge of the solid electrolyte layer extends beyond a second edge of the cathode and current collector layers, respectively.

18. (Original) The structure of claim 1, wherein the cathode layer comprises a cathode active material, an electrically conductive material, an ionically conducting polymer, and an electrolyte salt.

19. (Original) The structure of claim 1, wherein the cathode layer comprises a vanadium oxide material or a lithiated vanadium oxide material.

20. (Original) The structure of claim 1, wherein the cathode layer comprises a cathode active material selected from the group consisting of $LiCo0_2$, $LiNiO_2$, $LiMn_2O_4$, $Li[M(1-x)Mnx]O_2$ where $0<x<1$ and M represents one or more metal elements, polyacetylene, polypyrrole, polyaniline, polythiophene, MoS_2, MnO_2, TiS_2, $NbSe_3$, $CuCl_2$, a fluorinated carbon, Ag_2CrO_4, FeS_2, CuO, $Cu_4O(PO_4)_2$, sulfur, and polysulfide.

21. (Original) The structure of 1, wherein the solid electrolyte layer comprises a random polyether copolymer of ethylene oxide and an ether oxide selected from the group consisting of propylene oxide, butylene oxide, and alkylglycidylether.

22. (Original) The structure of 1, wherein the solid electrolyte layer comprises a crosslinked solid ionically conductive polymer comprising urethane groups, urea groups, thiocarbamate groups, or combinations thereof and inorganic particles.

23. (Original) The structure of claim 1, wherein the solid electrolyte layer comprises a first surface and a second surface, the first surface of the solid electrolyte layer contacting the second surface of the cathode layer, the structure further comprising an anode layer contacting the second surface of the solid electrolyte layer.

24. (Original) The structure of claim 23, wherein the anode layer comprises lithium.

25. (Original) The structure of claim 23, further comprising an electrical insulator layer contacting a second surface of the current collector layer.

26. (Original) A thin-film electrochemical cell structure, comprising:

a cathode sheet layer comprising a series of discontinuous cathode sheets, each of the cathode sheets comprising:

a first cathode layer comprising a first surface and a second surface;

a second cathode layer comprising a first surface and a second surface; and

a current collector layer disposed between the respective first surfaces of the first and second cathode layers;

a gap defined between adjacent ones of the cathode sheets;

a first solid electrolyte layer contacting the second surface of the first cathode layer and extending across the gaps defined between the adjacent cathode sheets; and

a second solid electrolyte layer contacting the second surface of the second cathode layer and extending across the gaps defined between the adjacent cathode sheets.

27. (Original) The structure of claim 26, wherein the first and second electrolyte layers respectively comprise a solid polymer electrolyte layer.

28. (Original) The structure of claim 26, wherein the gap defined between adjacent cathode sheets ranges between about 0.015 inches and about 0.4 inches.

29. (Original) The structure of claim 26, wherein a width of the cathode sheets ranges between about 0.75 inches and about 24 inches.

30. (Original) The structure of claim 26, wherein a length of the cathode sheets ranges between about 0.25 inches and about 24 inches.

31. (Original) The structure of claim 26, wherein the first and second solid electrolyte layers respectively encompass a perimeter of the cathode layer of each of the cathode sheets.

32. (Original) The structure of claim 26, wherein the respective first and second solid electrolyte layers comprise a first edge and a second edge, and each of the cathode sheets comprises a first edge and a second edge, the first and second edges of the respective first and second solid electrolyte layers extending beyond the first and second edges of each cathode sheet by between about 0.04 inches and about 0.31 inches.

33. (Original) The structure of claim 26, wherein the current collector layer comprises a first edge and a second edge, and the respective first and second cathode layers comprise a first edge and a second edge, the first edge of the current collector layer extending beyond the first edge of the respective first and second cathode layers.

34. (Original) The structure of claim 33, wherein the first edge of the current collector layer extends beyond the first edge of the respective first and second cathode layers by between about 0.08 inches and about 0.51 inches.

35. (Original) The structure of claim 33, wherein the second edge of the current collector layer extends beyond the second edge of the respective first and second cathode layers by between about 0.0 inches and about 0.315 inches.

36. (Original) The structure of claim 26, wherein the series of discontinuous cathode sheets is arranged in a plurality of rows to define a matrix of the discontinuous cathode sheets, and a gap defined between adjacent rows ranges between 0 inches and about 0.63 inches.

37. (Original) The structure of claim 26, wherein the respective first and second solid electrolyte layers comprise a first edge, the current collector layer comprises a first edge, and the respective first and second cathode layers comprise a first edge, the first edge of the current collector layer extending beyond both the first edge of the respective first and second cathode layers and the first edge of the respective first and second solid electrolyte layers.

38. (Original) The structure of claim 37, wherein the first edge of the current collector layer extends beyond the first edge of the respective first and second solid electrolyte layers by between about 0.04 inches and about 0.35 inches.

39. (Original) The structure of claim 37, wherein the first edge of the respective first and second solid electrolyte layers extends beyond the first edge of the respective first and second cathode layers.

40. (Original) The structure of claim 37, wherein a second edge of the respective first and second solid electrolyte layers extends beyond a respective second edge of the respective first and second cathode layers and current collector layers.

41. (Original) The structure of 26, wherein the respective first and second cathode layers comprise a cathode active material, an electrically conductive material, an ionically conducting polymer, and an electrolyte salt.

42. (Original) The structure of 26, wherein the respective first and second cathode layers comprise a vanadium oxide material or a lithiated vanadium oxide material.

43. (Original) The structure of 26, wherein the respective first and second cathode layers comprise a cathode active material selected from the group consisting of $LiCoO_2$, $LiNiO_2$, $LiMn_2O_4$, $Li[M(1-x)Mnx]O_2$ where $0<x<1$ and M represents one or more metal elements, polyacetylene, polypyrrole, polyaniline, polythiophene, MoS_2, MnO_2, TiS_2, $NbSe_3$, $CuCl_2$, a fluorinated carbon, Ag_2CrO_4, FeS_2, CuO, $Cu_4O(PO_4)_2$, sulfur, and polysulfide.

44. (Original) The structure of 26, wherein the respective first and second solid electrolyte layers comprise a random polyether copolymer of ethylene oxide and an ether oxide selected from the group consisting of proplylene oxide, butylene oxide, and alkylglycidylether.

45. (Original) The structure of 26, wherein the respective first and second solid electrolyte layers comprise a crosslinked solid ionically conductive polymer

comprising urethane groups, urea groups, thiocarbamate groups, or combinations thereof and inorganic particles.

46. (Original) The structure of claim 26, wherein the second solid electrolyte layer comprises a first surface and a second surface, the first surface of the solid electrolyte layer contacting the second surface of the second cathode layer, the structure further comprising an anode layer contacting the second surface of the second solid electrolyte layer.

47. (Original) The structure of claim 46, wherein the anode layer comprises lithium.

48. (Original) The structure of claim 46, further comprising a releasable separator layer contacting the second surface of the first electrolyte layer.

Claims 49-85 (Cancelled).